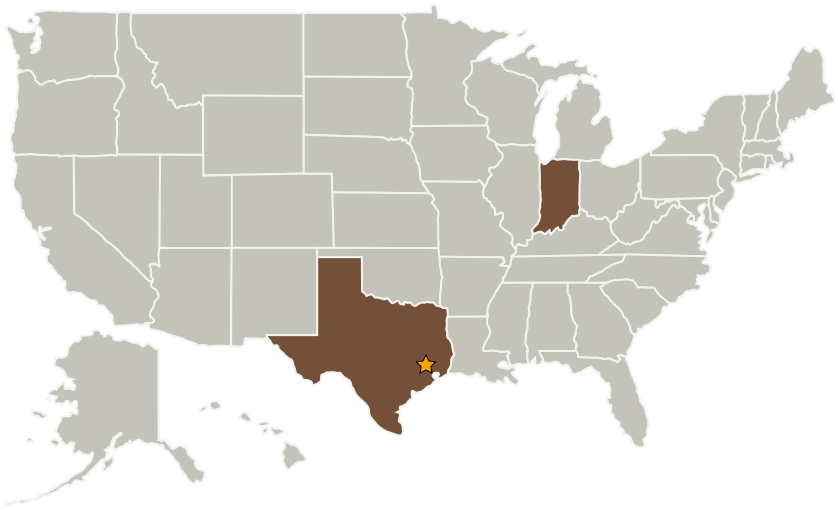
Microfluidic Analytical Separator for Proteomics, Phase II

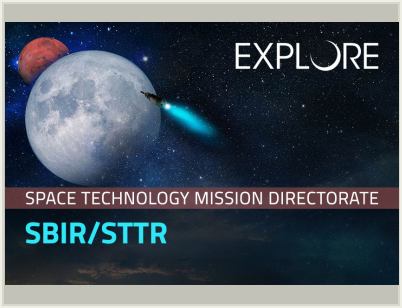
Completed Technology Project (2004 - 2006)

Project Introduction

The proposed innovation is a microfluidic device designed to effect a 2-dimensional resolution of a mixture of proteins based on isoelectric point (pI) and molecular weight (MW). The innovation performs tasks similar to those performed by 2-dimensional ("2-D") gel electrophoresis. To achieve 2-D-gel equivalence with minimal complications and maximum exploitation of the advantages provided by microfluidics a novel approach is proposed. In this approach the user dissolves or mixes a sample to be tested for proteins into a sample buffer and injects this into a plastic card consisting of microfluidic channels and electrodes. The card is inserted into a compact "reader" (small enough for space flight) that, within four hours, electronically reports the abundance of each protein detected. In Phase II research SHOT will (1) establish fabrication parameters for the card and manufacture prototypes, (2) build a breadboard reader and (3) test the Microfluidic Analytical Separator using mixed protein solutions. The innovation is useful in detecting specific protein ratio changes in blood or plasma, in extracts of experimental organisms subjected to varying environmental conditions, and in the medium-resolution high-throughput screening of pharmaceutical agents.

Primary U.S. Work Locations and Key Partners





Microfluidic Analytical Separator for Proteomics, Phase II

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Microfluidic Analytical Separator for Proteomics, Phase II

Completed Technology Project (2004 - 2006)

Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Techshot, Inc.	Supporting Organization	Industry	Greenville, Indiana

Primary U.S. Work Locations	
Indiana	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.3 Sample Handling